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EXAMINER	
LU, TOM Y	

ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 01/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/724,394	CRABTREE, RALPH N.	
	Examiner	Art Unit	
	Tom Y. Lu	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-60 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-60 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 01 December 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 5/3/04; 11/19/04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-60 are rejected under 35 U.S.C. 102(b) as being anticipated by Crabtree et al (U.S. Patent No. 6,185,314 B1).

   a. Referring to Claim 1, Crabtree discloses determining at least one position value of a first object; determining at least one position value of a second object; and comparing the position value of the first object with the position value of the second object to determine if the second object is in a queue with the first object (column 38, lines 49-55; column 39, lines 7-14).

   b. Referring to Claim 2, Crabtree discloses determining a distance between the first object and the second object (column 39, lines 11-12).

   c. Referring to Claim 3, Crabtree discloses determining the distance between the first object and the second object being at substantially a same point in time for the first object and the second object (column 39, line 8).

   d. Referring to Claim 4, Crabtree discloses determining if the determined distance between the first object and the second object is within a predetermined distance threshold (the distance threshold is the size of the queue area. In another words,

the distance between the first object and second object cannot exceed the queue size).

e. Referring to Claim 5, Crabtree discloses if the determined distance between the first object and the second object is within the predetermined distance threshold, then determining a velocity value of the second object (the threshold distance is the queue size, and if two objects are in a queue in one frame, the tracking on the next frame continues, which requires determining the velocity of objects as disclosed at column 25, line 25).

f. Referring to Claim 6, Crabtree discloses determining a displacement of the second object over a predetermined time period (velocity is displacement over time).

g. Referring to Claim 7, Crabtree discloses the predetermined time period being a rate at which positions of the first object and second object are sampled (frame rate; each frame is a time instance).

h. Referring to Claim 8, Crabtree discloses determining if the determined velocity value of the second object is within a predetermined velocity threshold (column 25, line 28).

i. Referring to Claim 9, Crabtree discloses determining if the determined velocity value of the second object is within the predetermined velocity threshold, then adding the second object to a queue set (the velocity of the second object is less than the maximum velocity is one of the conditions being in a queue).

j. Referring to Claim 10, Crabtree discloses removing the second object form the queue set if the distance between the first object and the second object exceeds the

predetermined distance threshold (if the distance between two objects exceeds the size of queue, then the object is not considered to be in the queue).

k. Referring to Claim 11, Crabtree discloses removing the second object form the queue set if the velocity of the second object exceeds the predetermined velocity threshold (if the velocity of an object exceeds the maximum velocity, it would not be in the queue).

l. With regard to Claims 12-15, Crabtree discloses the 6-step queue analysis disclosed at column 38, lines 56-67 and column 39, lines 1-20 is applied to all objects, which means it applies to the claimed "third object" as well.

m. With regard to Claims 16-20, the explanation in claims 5-9 about second object applies to the third object as well because Crabtree's 6-step queue analysis applies to all objects.

n. Referring to Claims 21-23, Crabtree discloses the distance between two objects is determined based on position information obtained at each time instance, column 39, lines 1-20.

o. Referring to Claim 24, Crabtree discloses determining a plurality of velocity values of the second object based on at least a subset of the plurality of position values and time values of the second object (column 25, line 25).

p. Referring to Claim 25, Crabtree discloses prior to comparing the position value of the first object and the second object, defining a seed zone within a predetermined distance from a seed location, the seed location corresponding to the beginning of the queue (column 39, lines 11-12 and 20-25).

q. Referring to Claim 26, Crabtree discloses determining if the first object is within the seed zone (column 39, lines 21-25).

r. Referring to Claim 27, Crabtree discloses determining if the first object meets a seed parameter (column 39, lines 23-25).

s. Referring to Claim 28, see column 25, lines 25-28 and column 39, lines 23-25.

t. Referring to Claim 29, see column 39, lines 20-25.

u. Referring to Claim 30, see column 39, lines 11-14.

v. Referring to Claim 31, see column 39, lines 20-25.

w. Referring to Claim 32, see column 39, lines 20-25.

x. With regard to Claims 33-39, see column 38, lines 50-67, and column 39, lines 1-25.

y. With regard to Claim 40, see column 25, lines 25-28.

z. With regard to Claim 41-42, see column 39, lines 20-25.

aa. Referring to Claims 43-46, as explained above, the 6-step queue analysis applies to all objects to be considered in a queue, which includes the claimed "third object"

bb. With regard to Claim 47, the processor is processor 130, column 4, line 31, the rest of limitations are addressed above.

cc. With regard to Claim 48, see explanation in Claim 4.

dd. With regard to Claim 49, see column 25, lines 25-28.

ee. Referring to Claim 50, the sensor is a video camera 110, which captures the positions of the objects in frames.

ff. Referring to Claim 51, processor 130 analyzes the movement of objects based on the frames obtained by the video camera 110, column 37, lines 9-10.

gg. With regard to Claims 52-56, see explanation in Claims 47-51.

hh. With regard to Claim 57, see column 38, lines 50-67 and column 39, lines 1-25.

ii. With regard to Claim 58, the only unaddressed limitation is "a processor readable medium storing code representing instructions to cause a processor to perform a process", column 5, lines 4-6.

jj. With regard to Claim 59, see column 39, line 2.

kk. With regard to Claim 60, see column 25, line 25.

2. Claims 1-9, 12-42 and 47-60 are rejected under 35 U.S.C. 102(b) as being anticipated by Janky et al (U.S. Patent No. 6,067,031).

a. Referring to Claim 1, Janky discloses a method comprising: a determining at least one position value of a first object; determining at least one position value of a second object; and comparing the position value of the first object with the position value of the second object to determine if the second object is in queue with the first object (Janky at column 4, lines 26-44 teaches applying LD module 13 for determining first vehicle's present location vector r(t; 1) and the second vehicle's location vector r(t; 2), and determining the separation distance d(t; 1; 2) between the first and second vehicles, which are determined to be in the same lane with use of "range module 81", column 9, lines 27-32. Note the first vehicle is the claimed 'first object"; the second vehicle is the claimed "second object" and position values are location vectors; and in queue means in the same lane).

b. Referring to Claim 2, Janky discloses determining a distance between the first object and the second object (separation distance d(t; 1; 2)).

c. Referring to Claim 3, Janky discloses determining the distance between the first object and the second object being at substantially a same point in time for the first object and the second object (the distance is determined at the same time with parameter t).

d. Referring to Claim 4, Janky discloses determining if the determined distance between the first object and the second object is within a predetermined distance threshold (the distance threshold is minimum separation distance d(t; 1; 2; sep) column 4, line 11).

e. Referring to Claim 5, Janky discloses if the determined distance between the first object and the second object is within the predetermined distance threshold, then determining a velocity value of the second object (column 8, lines 35-59).

f. Referring to Claim 6, Janky discloses determining the velocity value of the second object including: determining a displacement of the second object over a predetermined time period (see column 8, line 40 or equation 21).

g. Referring to Claim 7, Janky discloses the predetermined time period being a rate at which positions of the first object and second object are sampled (equation 21, t is the claimed predetermined time period).

h. Referring to Claim 8, Janky discloses determining if the determined velocity value of the second object is within a predetermined velocity threshold (V2, column 8, line 50).

i. Referring to Claim 9, Janky discloses if the determined velocity of the second object is within the predetermined velocity threshold, then adding the second object to a queue set

(if the relation as shown in block 102 in figure 4 is no, then the second vehicle is to be considered still in the same lane and the monitoring continues).

j. Referring to Claim 12, Janky discloses determining at least a position value of a third object; and comparing the position value of the third object with at least one of the position value of the first object and the position value of the second object to determine if the third object is in the queue (see figure 3, the third object is vehicle V3, the location coordinates of V3 are determined, column 9, lines 55-65, and the distance between V1 and V3 is determined based upon the location coordinates, and V3 is not in the same lane as V1 based on the location coordinates).

k. Referring to Claim 13, Janky discloses determining a distance between the third object and at least one of the first object and the second object (see equation 30).

l. Referring to Claim 14, Janky discloses determining the distance between the third object and at least one of the first object and the second object being at substantially a same point in time for the third object and at least one of the first object and the second object (column 9, equation 30).

m. Referring to Claim 15, Janky discloses determining if the determined distance between the third object and at least one of the first object and the second object is within a predetermined distance threshold (the distance threshold is the ranging module detecting range).

n. Referring to Claim 16, Janky discloses if the determined distance between the third object and at least one of the first object and second object is within the predetermined distance threshold, then determining a velocity value of the third object (with the distance is

within the ranging module detecting range, the velocity value of the third object is detected, column 10, line 2 and equations 31 and 32).

o. Referring to Claim 17, Janky discloses determining a displacement of the third object over a predetermined time period (see closure rate at column 10, line 1).

p. Referring to Claim 18, Janky discloses the predetermined time period being a rate at which positions of the first object and second object are sampled (parameter t).

q. Referring to Claim 19, Janky discloses determining if the determined velocity value of the third object is within a predetermined velocity threshold (column 10, equations 33A-34C).

r. Referring to Claim 20, Janky discloses if the determined velocity value of the second object is within the predetermined velocity threshold, then adding the third object to a queue set (when equation 34B is satisfied, V3 will change its traffic lane toward V1, and V3 and V1 will be in the same lane).

s. Referring to Claim 21, Janky discloses determining at least one position value of the first object including determining a plurality of position values of the first object, and said determining at least one position value of the second object including determining a plurality of position values of the second object (see figure 4, the operation of LD module and ranging module is continues and the position values of V1 and V2 are determined continuously).

t. Referring to Claim 22, Janky discloses determining a time value for each of the plurality of position values of the first object; and determining a time value for each of the plurality of position values of the second object (t is a variant parameter).

u. Referring to Claim 23, Janky discloses determining a distance between the first object and the second object at a plurality of corresponding time values of the first and the second object (the distance between vehicle V1 and V2 is determined continuously at plurality of times).

v. Referring to Claim 24, Janky discloses determining a plurality of velocity values of the second object based on at least at subset of the plurality of position values and time values of the second object (the velocity of the vehicle V2 is monitored continuously. Note velocity is a derivative of displacement with respect to time and displacement varies according to position changes).

w. Referring to Claim 25, Janky discloses prior to comparing the position value of the first object and the second object, defining a seed zone with a predetermined distance from a seed location, the seed location corresponding to the beginning of the queue (the seed zone with the coverage area of LD module and ranging module, and the predetermined distance is the ranging distance of the ranging module, and the seed location is the location of vehicle V1).

x. Referring to Claim 26, Janky discloses determining if the first object is within the seed zone (location of vehicle V1 is in the claimed "seed zone").

y. Referring to Claim 27, Janky discloses determining if the first object meets a seed parameter (vehicle V1 is determined to be traveling at a speed less than the speed of sound is to be considered meeting a seed parameter because of use of SONAR).

z. Referring to Claim 28, Janky discloses determining if a velocity value of the first object is within a predetermined seed velocity threshold during a predetermined time period (see explanation in Claim 27).

aa. Referring to Claim 29, Janky discloses determining if the displacement of the first object remains within a threshold displacement during a predetermined time period (a displacement traveled by vehicle V1 in time period t can be more than a displacement traveled by sound in the same time period. Note the displacement traveled by sound in the time period is the claimed "threshold displacement").

bb. Referring to Claim 30, Janky discloses determining if the first object is within a distance threshold from the seed location during a predetermined time period (see explanation in Claim 29).

cc. Referring to Claim 31, Janky discloses adding the first object to a queue set if it is determined that the first object meets the predetermined seed parameter (if vehicle V1 is traveling at a speed less than speed of sound and on a traffic lane, then vehicle V1 is in the claimed "queue").

dd. Referring to Claim 32, Janky discloses adding the second object to a queue set if it is determined that the second object is in the queue (all the vehicles in front of V1 and in the same lane are to be considered in a queue set, and V2 is determined to be in the same lane with V1, V2 is one of the vehicles then).

ee. Referring to Claim 33, Janky discloses a method, comprising: determining if a first track associated with a first object meets a predetermined seed parameter, the predetermined seed parameter including at least a position value of the first object; determining if a

second track associated with a second object meets a predetermined queue parameter, the predetermined queue parameter including at least a position value of the second object relative to the position value of the first object (the claimed first track associated with a first object is the path traveled or will be traveled by the vehicle V1; a predetermined seed parameter is the values associated with the SONAR, which includes the position value of the vehicle V1 because ranging module SONAR is installed on vehicle V1; second track associated with a second object is the path traveled or will be traveled by the vehicle V2; a queue parameter includes position information of vehicle V2, which is traveling before V1).

ff. Referring to Claim 34, Janky discloses determining if the first object remains within a fixed area during a predetermined time period (vehicle V1 remains in the coverage of ranging module).

gg. Referring to Claim 35, Janky discloses determining if the first object has a velocity within a threshold velocity during a predetermined time period (vehicle V1 is traveling at a speed less than a threshold speed of sound).

hh. Referring to Claim 36, Janky discloses defining a seed zone within a predetermined distance from a seed location, the seed location corresponding to the beginning of the queue (the seed zone is the coverage of the ranging module, and the seed location is the location of vehicle 1).

ii. Referring to Claim 37, Janky discloses determining if a portion of the first track is within the seed zone (a portion of the path traveled or will be traveled by the vehicle V1 is in the coverage of ranging module).

jj. Referring to Claim 38, Janky discloses if the first object is within a maximum distance from the seed location during a predetermined time period (vehicle V1 cannot travel faster than the speed of sound, and the vehicle V1 cannot travel beyond a distance determined by the SONAR during a predetermined time period, column 3, lines 43-46).

kk. Referring to Claim 39, Janky discloses determining if the second track remains within a predetermined distance from the first track during a predetermined time period (SONAR determines a distance between vehicles V1 and V2).

ll. Referring to Claim 40, Janky discloses determining if the second object has a velocity below a threshold velocity during a predetermined time period (vehicle V2 also travels at a speed that is smaller than the speed of sound).

mm. Referring to Claim 41, Janky discloses adding the first object to a queue set if it is determined that the first track meets the predetermined seed parameter (vehicle V1 meets the predetermined parameter of traveling a speed less than speed of sound, and vehicle V1 is in a traffic lane, therefore, vehicle V1 is in a "queue").

nn. Referring to Claim 42, Janky discloses adding the second object to the queue set if it is determined that the second track meets the predetermined queue parameter (vehicle V2 meets the queue parameter as explained above, and V2 is in the same lane before V1, therefore, V2 is in the "queue set").

oo. With regard to Claim 47, Janky discloses LD module 13 and ranging module 16 as the claimed "processor" to analyze movement of sensed objects, which are the vehicles surrounding vehicle V1 to determine positions of these vehicles during their traveling path; and distances between vehicle V1 and the surrounding vehicles, V2 and V3 are

determined by comparing the position of V1 and positions of V2 and V3, and V2 is determined to be in the same lane with V1.

pp. With regard to Claim 48, see explanation in Claim 4.

qq. With regard to Claim 49, see explanation in Claim 8.

rr. With regard to Claim 50, Janky discloses ranging module, SONAR, detects the positions of vehicles V2 and V3.

ss. With regard to Claim 51, Janky discloses LD module 13 analyzes the movement of the vehicles V2 and V3.

tt. With regard to Claim 52, a processor is explained and the rest of limitations are addressed in Claim 33.

uu. With regard to Claim 53, LD module 13 and ranging module 16 determine position of vehicle V1 and time period t to obtain location vector r(t; 1) and velocity v(t; 1), which shows a predetermined seed parameter is met because velocity v(t; 1) is less than the speed of sound.

vv. With regard to Claim 54, LD module 13 and ranging module 16 determine the path traveled by vehicle 2 meets a predetermined queue parameter based on the SONAR ranging which determines the inter-distance between V1 and V2, and determination of the inter-distance replies on the position information of V2 and time period it travels.

ww. With regard to Claim 55, see explanation 50.

xx. With regard to Claim 56, see explanation 51.

yy. With regard to Claim 57, see explanation 33.

zz. With regard to Claim 58, the only unaddressed limitation is a processor-readable medium storing codes, which Janky teaches his system is a computer system, which inherently contains such readable medium, and the parameters of first object is the position information and velocity of vehicle V1 and the time period traveled by V1, see column 4, line 34, same explanation applied to second object. The rest of limitations are addressed in Claim 1.

aaa. With regard to Claim 59, see explanation in Claim 58.

bbb. With regard to Claim 60, see explanation in Claim 58.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Janky. The arguments in Paragraph 2 above as to the applicability of Janky are incorporated herein.

a. Referring to Claim 10, Janky does not explicitly teach removing the second object from the queue set if the distance between the first object and the second object exceeds the predetermined distance threshold. Janky teaches when the separation distance is smaller than the minimum separation distance, the driver is advised about the condition, and it would be reasonable for a person of ordinary skill in the art to assume that the driver would decide to pass the preceding vehicle to

avoid a collision. And by passing the preceding vehicle, the vehicle 11 as shown in figure 1 is not in the same lane with vehicle 41.

b. With regard to Claim 11, see figure 4, block 103, and the motivation is the same as Claim 10.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom Y. Lu whose telephone number is (571) 272-7393. The examiner can normally be reached on 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571)-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Y. Lu

JOSEPH MANCUSO
PRIMARY EXAMINER